# CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

**NABL** - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377


Job No.: CTCE/BBMP/WNo.7/AP/CSR-05/046h/CEMENT/2016-17 Date: 24.05.2016

## TEST REPORT ON CEMENT

| | | |
|---|---|---|
| * CUSTOMER | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| *AGENCY | : | **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
| *NAME OF THE WORK | : | Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore. |
| REFERENCE | : | AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016 |
| SAMPLE ID | : | Cement-Sample 1 |
| SAMPLE RECEIVED ON | : | 23.05.2016 |
| PERIOD OF TESTING | : | 23.05.2016 to 24.05.2016 |

The results of the tests conducted on the cement sample are as follows:

| Sl. No | Descriptions | Test Method as per IS | Test Result | Requirements as per IS: 8112-2013 |
|---|---|---|---|---|
| 1 | Standard Consistency | IS-4031 (Part -4) 1988(RA-2009) | 29.50 % | - |
| 2 | a) Initial Setting Time | IS-4031 (Part -5) 1988(RA-2009) | 175 Minutes | Not Less than 30 Minutes |
| | b) Final Setting Time | IS-4031 (Part -5) 1988(RA-2009) | 465Minutes | Not More than 600 Minutes |
| 3 | Soundness by Le Chartlier Method | IS-4031 (Part-3) 1988(RA-2009) | 1 mm | Not more than 10mm |

*Information is furnished by the Customer/Representative.

Note:

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⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

*********

VISHWANATH .C
Quality Manager

Assistant Executive Engineer
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# CIVIL-TECH CONSULTANTS AND ENGINEERS

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**NABL** - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377


Job No.: CTCE/BBMP/WNo.7/AP/CSR-05/046h/SAND-Gradation/2016-17 : 24.05.2016

## TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. Akhilesh P,**
#3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24.

*** Name of Work** : Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore.

**Reference** : AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016

**Technical Reference** : IS : 2386 Part 1 - 1963 RA-2007

**Sample ID** : Fine Aggregates -Sample 1

**Sample Received on** : 23.05.2016

**Date of Testing** : 24.05.2016

Total Wt. of Aggregates in gms **1000**

| Is Sieve Size in mm | Cumulative Weight Passing in % | Spec.Limits as per IS 383-1970 (RA- 2007) | | | |
|---|---|---|---|---|---|
| | | Zone-I | Zone-II | Zone-III | Zone-IV |
| 10 | 100 | 100 | 100 | 100 | 100 |
| 4.75 | 94.80 | 90-100 | 90-100 | 90-100 | 95-100 |
| 2.36 | 81.20 | 60-95 | 75-100 | 85-100 | 95-100 |
| 1.18 | 56.20 | 30-70 | 55-90 | 75-100 | 90-100 |
| 600 Micron | 30.30 | 15-34 | 35-59 | 60-79 | 80-100 |
| 300 Micron | 17.10 | 5-20 | 8-30 | 12-40 | 15-50 |
| 150 Micron | 6.60 | 0-10 | 0-10 | 0-10 | 0-15 |

* Information is furnished by the Customer/Representative

**Remarks :** This sample is under Zone-I specific limits.

Civil-Tech Consultants & Engineers Bangalore

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T-2377


Job No.: CTCE/BBMP/WNo.7/AP/CSR-05/046h/AGG/GR/2016-17 : 24.05.2016

## TEST REPORT ON COARSE AGGREGATES

| | |
|---|---|
| * Customer | : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| * Agency | : **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
| * Name of Work | : Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore. |
| Reference | : AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016 |
| Technical Reference | : IS : 2386 Part 1 -1963 RA-2007 |
| Sample ID | : Coarse Aggregates (40mm) -Sample 1 |
| Sample Received on | : 23.05.2016 |
| Date of Testing | : 24.05.2016 |

Total Wt. of Aggregates in gms= **7000**

| Is Sieve Size in mm | Cumulative Weight Passing in % | Spec.Limits as per IS 383-1970 (RA- 2007) | |
|---|---|---|---|
| | | Graded | Single Sized |
| 80 | 100 | 100 | - |
| 63 | 100 | - | 100 |
| 40 | 97.71 | 95-100 | 85-100 |
| 20 | 36.50 | 30-70 | 0-20 |
| 10 | 17.19 | 10-35 | 0-5 |
| 4.75 | 3.53 | 0-5 | - |

* Information is furnished by the Customer/Representative

**Remarks :** This sample is under Graded specific limits.

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# CIVIL-TECH CONSULTANTS AND ENGINEERS

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**NABL** - Accredited Laboratory as per ISO / IEC-17025 : 2005


Job No.: CTCE/BBMP/WNo.7/AP/STEEL/2016-17 24.05.2016

## TEST REPORT ON REINFORCEMENT STEEL

| | | |
|---|---|---|
| Customer | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| Agency | : | **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
| Name of the Work | : | Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore. |
| Reference | : | AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016 |
| Date of Test | : | 24.05.2016 |
| Technical Reference | : | IS: 1786-2008 |

| Sl. No | Nominal size (dia) (mm) | Mass per metre (Kg/mtr) | TENSILE STRENGTH | | | Bend Test | Rebend Test |
|---|---|---|---|---|---|---|---|
| | | | 0.20% proof stress/Yield stress $N/mm^2$ | Tensile strength (Ultimate stress) $N/mm^2$ | Elongation percent gauge length | | |
| 1 | 8 | 0.40 | 515 | 548 | 13.05 | O.K | O.K |

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# CIVIL-TECH CONSULTANTS AND ENGINEERS

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Job No.: CTCE/BBMP/WNo.7/AP/STEEL/2016-17 24.05.2016

## TEST REPORT ON REINFORCEMENT STEEL

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|---|---|---|
| Customer | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| Agency | : | **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
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| Date of Test | : | 24.05.2016 |
| Technical Reference | : | IS: 1786-2008 |

| Sl. No | Nominal size (dia) (mm) | Mass per metre (Kg/mtr) | TENSILE STRENGTH | | | Bend Test | Rebend Test |
|---|---|---|---|---|---|---|---|
| | | | 0.20% proof stress/Yield stress $N/mm^2$ | Tensile strength (Ultimate stress) $N/mm^2$ | Elongation percent gauge length | | |
| 1 | 10 | 0.62 | 518 | 552 | 13.20 | O.K | O.K |

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Job No.: CTCE/BBMP/WNo.7/AP/STEEL/2016-17 24.05.2016

## TEST REPORT ON REINFORCEMENT STEEL

| | | |
|---|---|---|
| Customer | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| Agency | : | **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
| Name of the Work | : | Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore. |
| Reference | : | AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016 |
| Date of Test | : | 24.05.2016 |
| Technical Reference | : | IS: 1786-2008 |

| Sl. No | Nominal size (dia) (mm) | Mass per metre (Kg/mtr) | TENSILE STRENGTH | | | Bend Test | Rebend Test |
|---|---|---|---|---|---|---|---|
| | | | 0.20% proof stress/Yield stress N/mm² | Tensile strength (Ultimate stress) N/mm² | Elongation percent gauge length | | |
| 1 | 12 | 0.89 | 521 | 556 | 13.45 | O.K | O.K |

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T-2377


Job No.: CTCE/BBMP/WNo.7/AP/CSR-05/046h/CUBE/2016-17 23.06.2016

## TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

*** Customer** : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. Akhilesh P,**
#3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24.

*** Name of the work** : Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore.

*** Reference** : AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016

*** Sample ID** : RCC Drain Concrete

**Size of cubes** : 150mmx150mmx150mm

**Cross Sectional Area** : 22500 $mm^2$

**Technical Reference** : IS: 516-1959 (Reaffirmed 2008)

*** Grade of Concrete** : $M_{20}$

**Compressive Strength as on** : $28^{th}$ day

**Sample Received on** : 23.06.2016

| Sl.No. | Date of casting | Date of testing | Weight of cube (Kg) | Failure load (KN) | Compressive strength ($N/mm^2$) |
|---|---|---|---|---|---|
| 1 | 26.05.2016 | 23.06.2016 | 8.156 | 516.6 | 22.96 |
| 2 | 26.05.2016 | 23.06.2016 | 8.296 | 511.2 | 22.72 |
| 3 | 26.05.2016 | 23.06.2016 | 8.374 | 499.5 | 22.20 |

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T-2377


Job No.: CTCE/BBMP/WNo.7/AP/CSR-05/046h/CUBE/2016-17 24.06.2016

## TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

| | |
|---|---|
| *** Customer** | : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| *** Agency** | : **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
| *** Name of the work** | : Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore. |
| *** Reference** | : AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016 |
| *** Sample ID** | : RCC Drain Concrete |
| **Size of cubes** | : 150mmx150mmx150mm |
| **Cross Sectional Area** | : 22500 $mm^2$ |
| **Technical Reference** | : IS: 516-1959 (Reaffirmed 2008) |
| *** Grade of Concrete** | : $M_{20}$ |
| **Compressive Strength as on** | : $28^{th}$ day |
| **Sample Received on** | : 24.06.2016 |

| Sl.No. | Date of casting | Date of testing | Weight of cube (Kg) | Failure load (KN) | Compressive strength ($N/mm^2$) |
|---|---|---|---|---|---|
| 1 | 27.05.2016 | 24.06.2016 | 8.023 | 509.8 | 22.66 |
| 2 | 27.05.2016 | 24.06.2016 | 8.147 | 518.5 | 23.04 |
| 3 | 27.05.2016 | 24.06.2016 | 8.235 | 501.2 | 22.28 |

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T-2377


Job No.: CTCE/BBMP/WNo.7/AP/CSR-05/046h/CUBE/2016-17 27.06.2016

## TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

| | |
|---|---|
| * Customer | : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| * Agency | : **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
| * Name of the work | : Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore. |
| * Reference | : AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016 |
| * Sample ID | : Deck Slab Concrete |
| Size of cubes | : 150mmx150mmx150mm |
| Cross Sectional Area | : 22500 $mm^2$ |
| Technical Reference | : IS: 516-1959 (Reaffirmed 2008) |
| * Grade of Concrete | : $M_{20}$ |
| Compressive Strength as on | : $28^{th}$ day |
| Sample Received on | : 27.06.2016 |

| Sl.No. | Date of casting | Date of testing | Weight of cube (Kg) | Failure load (KN) | Compressive strength ($N/mm^2$) |
|---|---|---|---|---|---|
| 1 | 30.05.2016 | 27.06.2016 | 8.122 | 486.5 | 21.62 |
| 2 | 30.05.2016 | 27.06.2016 | 8.263 | 492.5 | 21.89 |
| 3 | 30.05.2016 | 27.06.2016 | 8.399 | 510.1 | 22.67 |

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T-2377


Job No.: CTCE/BBMP/WNo.7/AP/CSR-05/046h/CUBE/2016-17 28.06.2016

## TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

*** Customer** : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. Akhilesh P,**
#3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24.

*** Name of the work** : Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore.

*** Reference** : AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016

*** Sample ID** : Covering Slab Concrete

**Size of cubes** : 150mmx150mmx150mm

**Cross Sectional Area** : 22500 $mm^2$

**Technical Reference** : IS: 516-1959 (Reaffirmed 2008)

*** Grade of Concrete** : $M_{20}$

**Compressive Strength as on** : $28^{th}$ day

**Sample Received on** : 28.06.2016

| Sl.No. | Date of casting | Date of testing | Weight of cube (Kg) | Failure load (KN) | Compressive strength ($N/mm^2$) |
|---|---|---|---|---|---|
| 1 | 31.05.2016 | 28.06.2016 | 8.256 | 512.4 | 22.77 |
| 2 | 31.05.2016 | 28.06.2016 | 8.396 | 516.9 | 22.97 |
| 3 | 31.05.2016 | 28.06.2016 | 8.411 | 524.1 | 23.29 |

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**NABL** - Accredited Laboratory as per ISO / IEC-17025 : 2005


Job No.: CTCE/BBMP/WNo.7/AP/WMM/Gradation/2016-17 06.06.2016

## GRADATION FOR WMM
## MORTH TABLE-400-11

**Customer** : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.

**Agency** : **Mr. Akhilesh P,**
#3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24.

**Name of Work** : Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore.

**Reference** : AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016

Date of Testing : 06.06.2016

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **8333**

| Is Sieve Size in mm | Weight Retained (gm) | Cumulative Weight Retained (gm) | Cumulative % of Retained | Cumulative % of Passing | Spec.Limits |
|---|---|---|---|---|---|
| 53 | 0 | 0 | 0 | 100 | 100 |
| 45 | 205 | 205 | 2.5 | 97.5 | 95-100 |
| 22.4 | 2535 | 2740 | 32.9 | 67.1 | 60-80 |
| 11.2 | 1356 | 4096 | 49.2 | 50.8 | 40-60 |
| 4.75 | 1212 | 5308 | 63.7 | 36.3 | 25-40 |
| 2.36 | 970 | 6278 | 75.3 | 24.7 | 15-30 |
| 0.600 | 935 | 7213 | 86.6 | 13.4 | 8-22 |
| 0.075 | 920 | 8133 | 97.6 | 2.4 | 0-8 |

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# CIVIL-TECH CONSULTANTS AND ENGINEERS

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**NABL** - Accredited Laboratory as per ISO / IEC-17025 : 2005

JAS-ANZ BSCIC ISO 9001 REGISTERED


Job No.: CTCE/BBMP/WNo.7/AP/WMM/Gradation/2016-17 06.06.2016

## GRADATION FOR WMM
## MORTH TABLE-400-11

**Customer** : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.

**Agency** : **Mr. Akhilesh P,**
#3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24.

**Name of Work** : Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore.

**Reference** : AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016

Date of Testing : 06.06.2016

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **8369**

| Is Sieve Size in mm | Weight Retained (gm) | Cumulative Weight Retained (gm) | Cumulative % of Retained | Cumulative % of Passing | Spec.Limits |
|---|---|---|---|---|---|
| 53 | 0 | 0 | 0 | 100 | 100 |
| 45 | 185 | 185 | 2.2 | 97.8 | 95-100 |
| 22.4 | 2474 | 2659 | 31.8 | 68.2 | 60-80 |
| 11.2 | 1256 | 3915 | 46.8 | 53.2 | 40-60 |
| 4.75 | 1356 | 5271 | 63.0 | 37.0 | 25-40 |
| 2.36 | 1023 | 6294 | 75.2 | 24.8 | 15-30 |
| 0.600 | 920 | 7214 | 86.2 | 13.8 | 8-22 |
| 0.075 | 955 | 8169 | 97.6 | 2.4 | 0-8 |

**Note:**

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AE(WT)

# CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

**NABL** - Accredited Laboratory as per ISO / IEC-17025 : 2005


Job No.: CTCE/BBMP/WNo.7/AP/WMM/AIV/2016-17 06.06.2016

## Aggregate Impact Value

IS: 2386 Part IV

| | |
|---|---|
| **Customer** | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| **Agency** | **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
| **Name of the Work** | Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore. |
| **Reference** | AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016 |
| **Source / Location** | WMM Plant |
| **Type of Mix** | Wet Mix macadam |
| **Date of Testing** | 06.06.2016 |

| Sl No. | Details | Trial No. 1 | Trial No. 2 | Average |
|---|---|---|---|---|
| 1 | Total weight of aggregate sample filling the cylindrical measure = $W_1$ g | 385 | 382 | |
| 2 | Weight of agregate passing 2.36 mm sieve after the test = $W_2$ g | 88 | 85 | |
| 3 | Weight of aggregate retained 2.36 mm sieve after the test = $W_3$ g | 363 | 360 | |
| 4 | Aggregate Impact value = percent fines | 22.86 | 22.25 | |
| | 100* ($W_2/W_1$)% | | | 22.55 |

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

**Note:**

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Job No.: CTCE/BBMP/WNo.7/AP/WMM/AIV/2016-17 06.06.2016

## Aggregate Impact Value

IS: 2386 Part IV

| | |
|---|---|
| **Customer** | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| **Agency** | **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
| **Name of the Work** | Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore. |
| **Reference** | AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016 |
| **Source / Location** | WMM Plant |
| **Type of Mix** | Wet Mix macadam |
| **Date of Testing** | 06.06.2016 |

| Sl No. | Details | Trial No. 1 | Trial No. 2 | Average |
|---|---|---|---|---|
| 1 | Total weight of aggregate sample filling the cylindrical measure = $W_1$ g | 389 | 385 | |
| 2 | Weight of agregate passing 2.36 mm sieve after the test = $W_2$ g | 89 | 84 | |
| 3 | Weight of aggregate retained 2.36 mm sieve after the test = $W_3$ g | 365 | 363 | |
| 4 | Aggregate Impact value = percent fines | 22.88 | 21.82 | |
| | 100* ($W_2/W_1$)% | | | 22.35 |

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/WNo.7/AP/WMM/S-T/2016-17 06.06.2016

## DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

| | |
|---|---|
| Customer | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| Agency | **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
| Name of Work | Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore. |
| Reference | AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016 |
| Technical Reference | IS 2386(Part 1) 1963 (RA 2011) |
| Type of Mix | Wet Mix Macadam |
| Date of Testing | 06.06.2016 |

Result : Flakiness Index = **12.23%**

Elongation Index = **13.26%**

**Result : Combined Flakiness & Elongation index** **25.49%**

**Comments:**

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

**Note:**

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Job No.: CTCE/BBMP/WNo.7/AP/WMM/S-T/2016-17 06.06.2016

## DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

| | |
|---|---|
| Customer | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| Agency | **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
| Name of Work | Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore. |
| Reference | AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016 |
| Technical Reference | IS 2386(Part 1) 1963 (RA 2011) |
| Type of Mix | Wet Mix Macadam |
| Date of Testing | 06.06.2016 |

Result : Flakiness Index = **12.23%**

Elongation Index = **13.26%**

**Result : Combined Flakiness & Elongation index** **25.49%**

**Comments:**

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

**Note:**

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Job No.: CTCE/BBMP/WNo.7/AP/WMM/S-T/2016-17 06.06.2016

## DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

| | |
|---|---|
| Customer | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| Agency | **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
| Name of Work | Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore. |
| Reference | AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016 |
| Technical Reference | IS 2386(Part 1) 1963 (RA 2011) |
| Type of Mix | Wet Mix Macadam |
| Date of Testing | 06.06.2016 |

Result : Flakiness Index = **11.56%**

Elongation Index = **13.63%**

**Result : Combined Flakiness & Elongation index 25.19%**

**Comments:**

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

**Note:**

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# CIVIL-TECH CONSULTANTS AND ENGINEERS

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T-2377


Job No.: CTCE/BBMP/WNo.7/AP/CSR-05/046h/QB/2016-17 17.06.2016

## TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

| | | |
|---|---|---|
| *CUSTOMER | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| *AGENCY | : | **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
| *NAME OF THE WORK | : | Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore. |
| REFERENCE | : | AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016 |
| *SAMPLE ID | : | Bitumen |
| DATE OF SAMPLING | : | 12.06.2016 |
| DATE OF TESTING | : | 17.06.2016 |

The results of the tests conducted on the bitumen sample.

| Sl. No | Description | Test Method as per IS | Test Result | Requirement as per IS:73:2013 |
|---|---|---|---|---|
| 1 | Penetration at 25 $^0$C, 1/10 mm | IS :1203 -1978 (RA-2009) | 86 | 80 to 100 |
| 2 | Softening point, $^0$C | IS :1205 -1978 (RA-2009) | 56 | Min. 50 |
| 3 | Ductility at 27$^0$C, cm | IS :1208 -1978 (RA-2009) | 100 > | Min. 75 |
| 4 | Flash Point, $^0$C | IS :1209 -1978 (RA-2009) | 302 | Min. 220 |

*Information is furnished by the Customer/Representative.

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VISHWANATH .C
Quality Manager

M.L.N.D
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Job No.: CTCE/BBMP/WNo.7/AP/SDBC/Bit/2016-17

21.06.2016

## BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

**AS per IRC:SP:-11-1984**

| | |
|---|---|
| CUSTOMER | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| AGENCY | **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
| NAME OF THE WORK | Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore. |
| REFERENCE | AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016 |
| SAMPLE I/D | Roads in Ravishankar Residency Layout in Ward No. 7 |
| DATE OF TESTING | 21.06.2016 |

**BITUMEN CONTENT DETERMINATION**

| Description | Trail 1 | Trail 2 |
|---|---|---|
| 1. Weight of Mixture before Test, g | 500 | 500 |
| 2. Weight of Mixture after Test, g | 475 | 474 |
| 3. Weight of Asphalt and Mineral matter Extracted, g | - | - |
| 4. Weight of Mineral Matter, g. | - | - |
| 5. Weight of Ash, g | | |
| 6. Weight of Bitumen Extracted, g. (corrected) | 25 | 26.00 |
| 7. Bitumen content in % | 5.00 | 5.20 |
| 8. Average | **5.10** | |

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Job No.: CTCE/BBMP/WNo.7/AP/SDBC/Bit/2016-17

21.06.2016

## BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

**As per IS2386 and IRC:SP:11-1984**

| | |
|---|---|
| CUSTOMER | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore. |
| AGENCY | **Mr. Akhilesh P,** #3, Santrupthi, Vinayaka Layout (Old Venkategowda Layout), Hebbal Kempapura, Bangalore-24. |
| NAME OF THE WORK | Improvements to Roads and Drains at Ravishankar Residency Layout in Ward No. 7, Kodigehalli Sub Division, BBMP, Bangalore. |
| REFERENCE | AEE/(KOD.SUB.DIV)/103/2016-17 Dated: 23.05.2016 |
| SAMPLE I/D | Roads in Ravishankar Residency Layout in Ward No. 7 |
| DATE OF TESTING | 21.06.2016 |

### GRADATION AFTER EXTRACTION

| Sieve Size in mm | Trail 1 | | | | Specified Limits as per MORTH specification table 500-15 (Grading-2) |
|---|---|---|---|---|---|
| | Weight Retained, gm | % Retained | %Cummulative Retained | % Passing | |
| 13.2 | 0 | 0 | 0 | 100 | 100 |
| 9.5 | 34.23 | 7.21 | 7.21 | 92.79 | 90-100 |
| 4.75 | 254.89 | 53.66 | 60.87 | 39.13 | 35-51 |
| 2.36 | 50.23 | 10.57 | 71.44 | 28.56 | 24-39 |
| 1.18 | 41.23 | 8.68 | 80.12 | 19.88 | 15-30 |
| 0.3 | 25.96 | 5.47 | 85.59 | 14.41 | 9-19 |
| 0.075 | 40.23 | 8.47 | 94.06 | 5.94 | 3-8 |

| Sieve Size in mm | Trail 2 | | | | Specified Limits as per MORTH specification table 500-15 (Grading-2) |
|---|---|---|---|---|---|
| | Weight Retained, gm | % Retained | %Cummulative Retained | % Passing | |
| 13.2 | 0 | 0 | 0 | 100 | 100 |
| 9.5 | 28.56 | 6.03 | 6.03 | 93.97 | 90-100 |
| 4.75 | 253.23 | 53.42 | 59.45 | 40.55 | 35-51 |
| 2.36 | 50.23 | 10.60 | 70.05 | 29.95 | 24-39 |
| 1.18 | 36.89 | 7.78 | 77.83 | 22.17 | 15-30 |
| 0.3 | 28.52 | 6.02 | 83.85 | 16.15 | 9-19 |
| 0.075 | 43.56 | 9.19 | 93.04 | 6.96 | 3-8 |

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